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AGRICULTURE AND CONSERVATION

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Presentations

Rhys Green of RSPB and the University of Cambridge, UK, discussed reconciling crop production with biodiversity conservation. Agriculture is one of the biggest threats to biodiversity because it leads to extensive loss of habitat and the pesticide usage leads to environmental degradation. Agricultural environmentalists attempt to reconcile the two through two main practices – Land Sparing and Wildlife Friendly Farming.

Land Sparing concentrates on high intensity inputs and productivity on a portion of the land, leaving the remaining land free for biodiversity conservation. Land sparing, if followed properly, would have been successful in its objective. In practice, however, often when land is left uncultivated for biodiversity conservation, it is used for non-conservation processes like building roads and houses. This severely affects the feasibility of this form of biodiversity conservation.

Wildlife Friendly Farming is low in production and yield, but beneficial for the wildlife in the area. However, Wildlife Friendly Farming does not leave much land empty for pure biodiversity conservation. Both methods are likely to lower financial profits and farmers are compensated for economic losses that they suffer in order to help species survive. The viability of these methods also depends on the ecosystem of the area. Studies must be conducted before a method is chosen. With global food demands growing by two to three times by 2050 it is essential that we find methods of farming that can cater to the growing needs of the world as well as help conserve biodiversity.

Vijay Jardhari of the *Beej Bachao Andolan* (BBA, or Save the Seeds Movement), presented his experiences with conserving agro-biodiversity (agricultural biodiversity), in his village Jardhar in Uttarakhand, India, and in other parts of the region through the BBA. He tracked the changes in perceptions and methods of farming. Traditionally, farming was an esteemed profession and soil was a precious resource that had to be valued. It was treated like a living entity that needed nurturing and nourishment. Organic methods of farming were used that naturally let crop biodiversity flourish and kept the soil healthy.

Around 40 years ago, the Indian government propagated the use of high yielding varieties (HYV) of crops by doling them out at subsidised rates. These varieties needed chemical fertilizers and slowly changed the entire system of farming that originally existed. Initially people were surprised by the substantial increase in productivity, but over a period of time they realised that the yield stagnated or reduced with every year while the need for expensive and harmful chemical fertilizers and pesticides increased. The people of Jardhar decided to revert back to their traditional practices of farming. The main method they used was the *Baranaja* system where a variety of crops and plants are grown together in what seems to be an incoherent and random melee, but the system is a time-tested method of growing a variety of crops, providing a variety of needs, as also allowing biodiversity to flourish and keeping the soil healthy and productive.

The *Beej Bachao Andolan* (Save the Seeds Movement) was later started in the village to work towards recovering seeds that were lost due to the heavy influx of HYV (high-yielding variety) seeds during the Green Revolution. Since the starting of the *Beej Bachao Andolan*, hundreds of varieties of seeds have been recovered. There are a number of *Mahila Mandals* (women groups) that look into farming and biodiversity issues.

While protecting agro-biodiversity, the village simultaneously put systems in place to protect its forests. This has resulted in healthy forests and land, an increase in biodiversity and high underground water tables. This is essential for places like Jardhar where a vast majority of the population is still directly dependent on agriculture and forest produce. The *Beej Bachao Andolan* also focuses on information dissemination on conservation.

The major problems faced by Jardhar are the waning interest of the younger generation in the movement and the threats from destructive development projects like mining. Currently, the village is also trying to stop hybrids and genetically modified (GM) crops from entering their farming systems. They are fearful that the government will propagate GM seeds by selling them at subsidised rates and advertising them as the strongest and highest yielding varieties of seeds,

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A report on the session held at the International Conference on 'Conserving Nature in a Globalizing India' at Bengaluru; February 17-19, 2009 much like they did with HYV seeds. The people of Jardhar think that since Uttarakhand is supposed to be an organic state, GM seeds should not be propagated.

Siddappa Setty of the Bangalore-based NGO Ashoka Trust for Research in Ecology and Environment (ATREE), talked about the agricultural and wildlife conservation practices of the Soligas, a tribe in the Biligiri Rangaswamy Temple Wildlife Sanctuary (BRTWLS). The Soligas farm on land and collect non-timber forest produce (NTFP) from within and outside the sanctuary. Prior to 1972 (the year the Wildlife Act was promulgated), wild animals consumed half of the crops that were cultivated by the tribe, which they tolerated, but later as their access to land reduced dramatically due to conservation policies, they could not afford to lose such vast quantities of crops anymore.

Traditional methods of farming are still used to grow a variety of crops and conserve seeds. They previously used shifting cultivation, leaving land fallow for four to five years to let it regenerate before using it again. This method was later prohibited within the BRTWLS, and broadcast sowing methods in settled agriculture were adopted. However, the irregular crop arrangement makes it difficult to remove weeds. To tackle this problem, the sowing patterns were changed from broadcast to in-line. The systematic rows of crop made it easier to locate and remove weeds. However, different problems cropped up with this method and it was discontinued. Farmers on hill slopes and those who did not have cattle to help them cultivate, found this method cumbersome and were the first people to revert to their earlier methods. Farmers also realised that removing the weeds gave wild boars better access to the crops. After four years of experimenting, most of the farmers have returned to broadcast farming. Traditional farming is currently threatened both by the increase in the number of coffee plantations in the area as well as the excessive growth of Lantana in the WLS, which in turn is forcing wild animals to enter the Soliga farms in search of food.

Raman Sukumar of CES and IISc, spoke about human-elephant conflict in agricultural landscapes. According to Sukumar, this is an age-old problem and cannot be completely eradicated, however, one can definitely work towards reducing losses. There should be extensive studies on the extent of damage caused by elephants along with the variety and quantity of food available in the forest, as this information will help unravel the motivational factors behind the instances of crop raiding. After all, elephants take to fields for the same reasons that humans do – limited access to forest produce, and for the nutrition and the taste of farm grown crops.

These studies can be followed by bringing about changes in cropping patterns and enforcing landscape planning to increase the availability of nutritious food for the elephant populations within forests. However, increasing forest cover does not necessarily reduce human-elephant conflict because degraded land often has a higher carrying capacity of elephants than a rich forest. Often more elephants are found in buffer zones than in core areas. This is apparent in Joint Forest Management sites where forests have provided shelter but not food for elephants. Thus, they raid crop from farms nearby and then use the newly regenerated forests to hide. Sukumar also noted that elephants are now travelling to forests where they were not found earlier. He said that although the number of conflicts has reduced over the last 20 years because the male population has decreased, the compassion people had for the animal has also decreased. Thus, communities that traditionally refused to kill elephants even when there were human casualties, are now open to culling animals to prevent farm raids.

Discussion

The presentations were followed by a discussion. One of the main questions revolved around what individuals could do to support these efforts. Jardhari asked people to revaluate their own lifestyles and find out where they could make changes. He suggested small things like terrace gardens, buying locally grown food and organic food if it was possible. He also asked people to reconsider eating industrial meat because the production and transportation of such meat costs a lot in terms of resource consumption.

Some participants questioned the viability of organic farming by stating that it was replaced by Green Revolution in the 1970s because organic farming was incapable of producing sufficient quantities to feed the country. They pointed out that food needs are much higher than they were before and will double or triple in the next few decades and wondered how organic farming would be sustainable now if it wasn't earlier. They asked if perhaps, it was necessary to continue with non-organic methods of farming and add to them by using genetically modified (GM) seeds.

The speakers reminded the audience that the Green Revolution was aggressively pushed onto farmers by heavily subsidising the cost of HYV seeds and fertilisers. However, these prices changed, the quality of the soil decreased and ultimately the production levels dropped, making this form of farming unsustainable. Furthermore, it has led to farmer suicides across the country and these deaths must be accounted for while assessing the sustainability of non-organic methods of farming.

The speakers acknowledged that organic farming also had its drawbacks and said it should be used only when it seemed to be the most sustainable (in terms of economics and ecology) option. Unfortunately, several farmers have forgotten traditional methods of farming because they have been using the Green Revolution methods for decades. This meant that even though farmers might want to revert back to organic farming they no longer have the means and knowledge to do so.

The speakers feared that pushing GM seeds would have effects similar to that of the Green Revolution. The solution to this was forming networks that could help each other with farming methods and seeds. Linking markets and locally produced food was also the need of the hour. This has been achieved by the Deccan Development Society in Zaheerabad (Andhra Pradesh, India), by linking the public distribution system to a variety of local, organically produced, nutritious crops.

In response to the question about the looming food crisis, the speakers said the solution was not more intensive farming on larger patches of land but farming more essential foodstuffs rather than non-essential cash crops. They also recommended adopting eating habits that are easier to sustain like eating more bajra and unpolished rice. Finally, one would also have to question the social hierarchy of farming methods. For instance, dry land farming is viewed as inferior to water intensive irrigated methods even if it is more effective under certain conditions. If such false hierarchies were done away with, appropriate methods would be adopted to suit particular land types and farming would be more effective. Working on these structures takes time and energy. In Zaheerabad, it took fifteen years to prove that dry land farming was the more effective method.

The session ended with a discussion on GM seeds. A comparison was drawn between growing monocultures of GM seeds and using traditional organic forms of agro-biodiversity. People argued that if a farm has a rich diversity of crops, this diversity acts as a buffer. If a particular crop gets infected and dies, there will still be other crops that assure the farmer of some food and sustenance. This was not the case with monocultures of hybrid, HYV, or GM crops as the produce of a whole farm would be wiped out if an infection or a disease attacked the crop. The discussion veered to the ethical arguments for and against GM, and naturally available seeds. People were divided on whether they were more comfortable with one or the other kind of seeds. Participants agreed that there was insufficient scientific data to prove whether one form of farming was better than the other due to a paucity of examples of direct comparisons between the two forms. However, observations from the various examples of organic, sustainable, biodiverse farming suggested that such alternatives could be viable in the long run for India, and provide appropriate resolutions for the conflicts between agriculture and biodiversity conservation.

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